

DATE: June 13, 2001

TO: Distribution

SUBJECT: May 15, 2001, Solid State Recorder Status Meeting

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I. INTRODUCTION

Mr. T. Sobchak convened the May 22, 2001 Solid State Recorder (SSR) status meeting to provide a status for the SSRs and discuss long-term operations recorder dumps. Mr. Sobchak stated that one of the issues facing the network is the upcoming unavailability if the Air Force Satellite Control Network (AFSCN) Remote Tracking Sites (RTS).

II. MEETING

- A. Onizuka Air Force Station (OAFS) (refer to the *Long-Term Support of Ops Recorder Dumps* attachment). The Air Force (AF) is closing OAFS for National Aeronautics and Space Administration (NASA) support. Support is being relocated to Shriever Air Force Base (AFB). Control centers will be established for each customer. The AF has informed NASA that the cost will be borne by the customer. The cost estimates have continued to escalate into the millions of dollars. NASA is not planning on moving to Shriever. NASA has informed the AF that the Space Shuttle Program (SSP) should not be mentioned as leverage for funding/upgrade issues at Shriever. GOES/POES/TDRS will remove requirements for support after 2002. Space Shuttle support is planned through October 2002. The facilities will be used until that time and then support will be transitioned to TDRS K-band, NASA ground sites (Dryden Flight Research Center [DFRC], Wallops [WPS], and Merritt Island [MIL]), or commercial assets.
- B. Commercial Sites. Orbiter upgrades will improve ops recorder management. The upgrades to Orbiter include the use of the SSR. This will facilitate the use of TDRS. NASA is evaluating the use of commercial sites. The Universal Space Network (USN) has contracted with other countries and agencies to form a semi-network of sites that could be used. There are some limitations with the USN (data return delays [2 hours], NRC, and recurring costs). Not all sites are a 24-hour operation. Not all sites have agreements with USN yet. Data is delivered to the Network Management Center (NMC) in Pennsylvania where it is provided to the NASA Integrated Services Network (NISN) IONet. The data delay is expected to be 2 hours from the time of dump complete. Options may be explored that include buying increased Bandwidth (BW) on demand or transporting data via TCP or FTP. Potential primary sites include Hawaii, Santiago, Overberg (South Africa), and Dongara (Australia). Mr. T. Sobchak

stated that the options need to be evaluated; it may be more cost effective to increase the data rates from DFRC, WPS, and MIL.

- C. Commercial Site Discussion. Mr. D. Miller stated that Johnson Space Center (JSC) may not want to use the sites due to the 2-hour data delivery delay. Changes to the software have created a new process for handling the data dumps. It would be necessary to rebuild the dump queues. It could be done, but it doubles the workload. Mr. G. Horlacher stated that the use of the three CONUS sites should be investigated further. A discussion ensued as to how the SSRs make the storage and dumping process more efficient, but do not increase the amount of data stored onboard. Mr. Sobchak reiterated that the available sites are not all 24x7. There are scheduling considerations at WPS. MIL runs a two-shift operation, so the shifts can be maximized for coverage. Mr. R. Kraesig stated that WPS has received dumps. WPS and Mil can handle the 1024-kb/sec data. DFRC can only handle the 512-kb/sec playbacks. Mr. Sobchak stated that it will be necessary to discuss the line rates with NISN. What would the cost be to increase the line rates for the CONUS sites to handle the needed data rates? The commercial sites are using ISDN and the rates are not that high. Messrs. G. Horlacher and D. Miller were assigned a multi-part action item to: 1) Determine which commercial tracking sites could be helpful for support, 2) Determine which commercial sites would be preferred, and 3) Evaluate the possibility of increased use of CONUS sites (action item SSR-05-00-1). Mr. Sobchak asked if increased TDRS use was an option. Messrs. G. Horlacher and D. Miller were assigned a multi-part action item to: 1) Determine what the increased TDRS use scenarios are and how much time would be required (normal mission profiles) and 2) Determine how many CONUS passes will be required outside the deployed time (action item SSR-05-00-02). The issue of the line rates was raised again. Mr. B. Schneck was assigned an action item to determine what is required to get higher dump rates (up to 2048 kb/sec) from the CONUS sites (action item SSR-05-00-03).
- D. Solid State Recorder Operation (refer to the *Solid State Recorder Operation* attachment). The SSR functionally replaces the Ops Recorders on the Space Shuttle. The SSR uses the existing Orbiter FM Ku-band Channel interfaces. The 2048-kb/sec dump rate is highly desirable. All SSR dumps are forward only. The Space Shuttle Main Engine (SSME) dump is at 960 kb/sec with no gap between E1, E2, and E3 data. Mr. R. Kraesig suggested that Marshall Space Flight Center (MSFC) and Kennedy Space Center (KSC) be contacted to discuss the new SSME recorder operations. The OARE dump is at 960-, 1024-, or 2048 kb/sec. The 640-kb/sec rate is not available. There is no gap between sample periods. The 32-, 64-, and 192-dump rates are available for troubleshooting. The SSR will be used in early 2001 (STS 110). Each vehicle will be modified after STS 100, unless there is an unusually short turnaround between flights. The vehicles (except OV103) will be modified at the KSC. Operational improvements include: no Ku-band Channel I/Q reversals, no requirements for 640- or 1536-kb/sec dumps, no dump time lost to rewinding or track selection, more reliable hardware, better utilization of available memory, and crystal-controlled accuracy on dump rates.

III. SGLS MODE

Mr. T. Sobchak discussed the SGLS mode requirements. Mr. Sobchak asked if the requirement could be removed prior to 2002. Mr. G. Horlacher thought that it would not be a problem, but the program would have to give final approval. Mr. Sobchak stated that NASA was confident that the October 2002 date was firm. The AF is stating that there is a firm requirement to provide SGLS support. NASA would like to remove the requirement. Mr. R. Kraesig said that it was useful on DFRC landings. Mr. Sobchak stated that the telemetry requirement could be maintained, but would at least like the command requirement removed. JSC will take the request to the program.

IV. ACTION ITEM REVIEW

The following action items were assigned at the meeting:

SSR-05-00-01 Gary Horlacher, Dave Miller

ACTION: Determine which commercial tracking sites could be helpful for support. Determine which commercial sites would be preferred. Evaluate the possibility of increased use of CONUS sites.

SSR-05-00-02 Gary Horlacher, Dave Miller

ACTION: Determine what the increased TDRS use scenarios are and how much time would be required (normal mission profiles). Determine how many CONUS passes will be required outside the deployed time.

SSR-05-00-03 Bruce Schneck

ACTION: Determine what is required to get higher dump rates (up to 2048 kb/sec) from the CONUS sites.

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